

NEW GENERA AND SPECIES OF AUSTRALIAN
FISHES.

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In the present paper two new genera are characterised, namely, *Monothrix* for a Brotulid allied to *Dinematichthys* but differing in the dentition, the uniradial ventrals, &c., and *Austrophycis* for a Gadid, closely allied to *Physiculus* and *Silota*, with the latter of which it agrees in the forward position of the anal fin, but differs in the dentition and other particulars. Full diagnoses are given of the clupeid genera *Hyperlophus* and *Potamalosa*, in fulfilment of a promise made at last October's meeting. Ten species of fishes are described as new, namely, *Heptranchias haswelli*, *Spratelloides robustus*, *Kowala castelnuai*, *Hyperlophus copii*, *Mugil hypselosoma*, *M. georgii*, *Cestraeus norfolcensis*, *Odax attenuatus*, *Monothrix polylepis*, *Austrophycis megalops*, and *Otophidium genyopus*. Opportunity has also been taken to make some further remarks on *Pseudomugil signifer* and *Dermatopsis macrodon*.

While examining the specimens of the notidanoid sharks contained in the collections of the Australian and University Museums, I came upon the curious jaws of which I give a description below :—

HEPTRANCHIAS HASWELLI, sp.nov.

Upper jaw.—Median tooth well developed, subulate, bent backwards but with a distinct curve towards the left, and without basal cusps; it is followed by three similar teeth and flanked by a pair of similar and but slightly larger teeth, which are directed outwards and backwards, and are provided with an inconspicuous cusp on either side of the base; these two together with the anterior tooth of the median series are inserted in advance of the functional row, which are on the same level with the second tooth of the median series; behind each of the lateral pair are three teeth which increase in size posteriorly, the last two being

provided with a pair of small cusps on either side of the base; the outer row consists of eight teeth (on each side of the second median tooth) which decrease in size from the front, and have each a prominent cusp directed more or less obliquely backwards and one or more subsidiary cusps, the second and third having a single strong acute cusp at the base posteriorly, the fourth one anteriorly and two posteriorly, the others three or four on either side; the fourth, fifth, and sixth are about equally broad at the base and conspicuously broader than the others;* between the last serrated tooth and the angle of the mouth are ten series of small chisel-shaped teeth, each series consisting of seven teeth, those in front being the largest.

Lower jaw.—Median tooth with a strong mesial cusp which is inclined towards the right and four lateral cusps on each side, the distal pair being the strongest; behind these are three similar teeth; the outer row of cutting teeth is inserted on a line with the anterior tooth of the median series; each tooth is provided with six† functional cusps which decrease in size from the front in regular gradation, the anterior and principal cusp having from five to seven serræ on its basal edge in front; these serræ increase in size outwards; the third and fourth teeth are the largest, and there are four series behind the outer row; as in the upper jaw, there are ten series of chisel-shaped teeth beyond the last cutting tooth.

Dimensions.—The distance between the base of the median tooth of the upper jaw and the end of the dentigerous portion of the palato-quadrate is three-fourths of its distance from the angle of the mouth, which is a little less than that between the last teeth of each ramus and five-sixths of that between the angles of the mouth; the distance between the middle of the base of the lower median tooth and the end of the last cutting tooth is two-thirds of the space between the two posterior cutting teeth.

* Owing to the state of the jaws, I am unable to say how many series of teeth are present.

† Sometimes a minute seventh cusp is present.

Depth of gape (from angle to base of median teeth).. 212 mm.

Width of gape (from angle to angle)..... 160 „

The history of this pair of jaws, which is in the University Museum and is labelled "Cape of Good Hope?" is most unsatisfactory; briefly, as related to me by Mr. George Masters, the Curator, it amounts to the following:—

The specimen originally formed part of the old collection made by W. Sharpe Macleay, and it was only after that gentleman's death that the label was attached by order of the late Sir William Macleay, but on what grounds he believed it to come from the Cape Mr. Masters does not know. It is plain, therefore, that the locality given on the label cannot be depended on.

As the individual from which these jaws were taken is unknown, I cannot be certain as to which of the recent genera of notidanoid sharks the present species properly belongs, but it plainly comes nearest to *Heptanchias* in the presence of a strong coronal cusp to the median tooth of the lower jaw, a character which is found only in the *Squalus cinereus* of Gmelin, which is the type of Rafinesque's genus; in that species, however, the symphysis of the upper jaw is toothless.

I have much pleasure in dedicating this new and interesting Notidanid to my friend Prof William A. Haswell, whose important paper on the *Notorhynchus indicus* was published in our Proceedings some years ago.

SPRATELLOIDES ROBUSTUS, sp.nov.

D. 11-12. A. 10-11. Sc. 43-45/9.

Body rather short and stout, with the ventral profile slightly more convex than the dorsal; head moderate, its length $3\frac{3}{4}$ to $4\frac{1}{4}$, the depth of the body $4\frac{1}{5}$ to $5\frac{1}{3}$ in the total length; width of the body $1\frac{1}{2}$ to 2 in its depth; depth of the head $1\frac{2}{5}$ to $1\frac{3}{4}$, width of the head $2\frac{1}{2}$ to $2\frac{3}{5}$, of the interorbital region $4\frac{3}{5}$ to 5. diameter of the eye $3\frac{1}{5}$ to $3\frac{1}{2}$ in the length of the head; interorbital region flat; snout moderate, as long as or a little longer than the diameter of the eye. Premaxillaries inconspicuously emarginate in front;

maxillary moderately broad and falciform, with its lower border entire, its distal extremity rounded and extending to or a little beyond the vertical from the anterior margin of the eye; its length is $2\frac{6}{7}$ to 3 in that of the head, and its greatest width is $2\frac{2}{3}$ to $2\frac{6}{7}$ in its length. No perceptible teeth. Opercle with its hinder border sinuous, its lower border linear and slightly oblique, and its length $1\frac{2}{3}$ to $1\frac{1}{5}$ in its depth; subopercle very narrow; limbs of the preopercle meeting almost at a right angle, the lower not produced, the posterior linear and subvertical. Thirty-two or thirty-three gill-rakers on the lower branch of the anterior arch, the longest $1\frac{1}{5}$ to 2 in the diameter of the eye.

The space between the origin of the dorsal fin and the extremity of the snout is $1\frac{1}{5}$ to $1\frac{3}{10}$ in its distance from the root of the caudal; the second or third ray is the longest, about two-fifths longer than the base of the fin and $1\frac{1}{2}$ to $1\frac{3}{5}$ in the length of the head; the outer border is truncated or very slightly rounded: anal fin with the outer border emarginate, the third and fourth rays the longest, as long as or a little shorter than the diameter of the eye, and $1\frac{1}{2}$ to $1\frac{3}{4}$ in the length of its base, which is less than that of the dorsal, and as long as or a little shorter than its distance from the caudal; the last ray is thickened, profusely branched, and a little produced, and extends when laid back midway to the root of the caudal: ventral fin inserted from one-tenth to one-fifth nearer to the base of the caudal than to the extremity of the mandible, with the outer border rounded, the first ray simple and not quite so long as the second and third, which are $1\frac{3}{4}$ to $2\frac{1}{5}$ in the length of the head: pectoral fin with fourteen rays, the outer border rounded, the second ray simple and scarcely shorter than the third, which is longest, $1\frac{3}{5}$ to $1\frac{3}{4}$ in the length of the head: caudal fin forked, with the lobes subequal, $1\frac{1}{4}$ to $1\frac{1}{3}$ in the length of the head; the least depth of its peduncle is about one-fourth less than its distance from the anal.

Scales smooth; axillary scale of the pectoral well developed, lanceolate, much longer than that of the ventral, which is rather shorter than the diameter of the eye; a pair of oval scales along the basal half of each caudal lobe.

Upper surface of head and body deep ultramarine-blue, the sides and lower surfaces silvery more or less tinged with violet; snout and preorbitals mostly silvery: dorsal fin with a few dark dots, especially on the anterior rays: irides golden, clouded above with blue.

Distribution.—Coast of New South Wales.

Length to 70 millimeters.

Type in the Australian Museum, Sydney; register number I. 3668.

I am unable to give any information with respect to this species beyond the fact that it visits our shores annually, sometimes in enormous numbers, during the late summer and the autumn months. Not more than half a dozen examples have, however, come under my notice, and neither of the two dissected showed any symptoms of breeding. Mr. Edward Skinner, of Manly, tells me, however, that it is well known to the fishermen, by whom it is called "Tailor Maray," on account of the number of Tailors (*Pomatomus saltatrix*) which invariably accompany and feed upon them.

KOWALA CASTELNAUI, sp.nov.

D. 17-19. A. 19-21. Sc. 44-45/12.

Body ovate, the ventral profile much more convex than that of the dorsal; head rather short and deep, its length $3\frac{1}{5}$ to $4\frac{1}{5}$, the depth of the body $2\frac{2}{3}$ to $3\frac{1}{5}$ in the total length; width of the body $2\frac{1}{4}$ to $2\frac{7}{10}$ in its depth; depth of the head 1 to $1\frac{1}{6}$, width of the head $1\frac{3}{4}$ to 2, of the interorbital region $3\frac{1}{2}$ to $3\frac{2}{3}$, diameter of the eye $2\frac{1}{3}$ to 3 in the length of the head. Eye large, with the adipose lid well developed; interorbital region slightly convex; snout short and broad, one-fourth to one-third of a diameter shorter than the eye. Premaxillaries forming together a conspicuous emargination anteriorly; lower border of the maxillary rounded and finely denticulated, the upper border notched towards the tip; the distal extremity is rounded and extends to or not quite to the vertical from the anterior margin of the pupil; its

length is 2 to $2\frac{1}{5}$ in that of the head, and its greatest width is $2\frac{2}{3}$ to $2\frac{3}{5}$ in its length. Both jaws with a single series of small teeth anteriorly; a few small teeth on the palatines and along the median ridge of the tongue; vomer and pterygoids toothless. Opercle with the posterior border sinuous, the lower border oblique and feebly convex, its length $2\frac{2}{3}$ to $2\frac{3}{4}$ in its depth; subopercle deep and rhomboid, with the lower angle rounded, the upper border bent upwards and forming an acute angle with the hinder border, and its depth about three-fourths of its length; lower limb of preopercle extending forwards to below the front margin of the eye, the angle broadly rounded, the posterior border gently emarginate and vertical. Forty-four to forty-six gill-rakers on the lower branch of the anterior arch, the longest about a half of the diameter of the eye.

The space between the origin of the dorsal fin and the extremity of the snout is $1\frac{1}{5}$ to $1\frac{1}{3}$ in its distance from the root of the caudal; the fourth ray is the longest, a little longer than the base of the fin, and $1\frac{1}{5}$ to $1\frac{2}{5}$ in the length of the head; the outer border is slightly emarginate: anal fin with the outer border emarginate, the third ray the longest, as long or nearly as long as the diameter of the eye, and $1\frac{1}{2}$ to $1\frac{3}{4}$ in the length of its base, which is much less than that of the dorsal; the last ray is somewhat produced, and extends when laid back nearly to, to, or a little beyond the base of the caudal: ventral fin inserted much nearer to the base of the caudal than to the extremity of the lower jaw, with slightly convex outer border, the first ray simple and not quite so long as the second, which is $1\frac{1}{5}$ to 2 in the length of the head: pectoral fin with fifteen rays, and the outer border rounded, the third ray the longest, reaching to or a little beyond the vertical from the origin of the dorsal, and $1\frac{1}{5}$ to $1\frac{1}{4}$ in the length of the head: caudal fin deeply forked, with the lower lobe somewhat the longer, from two-fifths to one-half longer than the head; the least depth of its peduncle is more than twice its distance from the anal.

Scales thin, each with three or four vertical striae, which usually branch off from a median longitudinal stria, and with the free margin entire; axillary scale of the ventral small and triangular,

its length from four-sevenths to four-ninths of a diameter of the eye; base of the caudal fin scaly; sixteen to eighteen strong keeled scales in advance of and eleven to thirteen behind the origin of the ventral fin. Temporal region with three or four well marked parallel striae; postfrontal area quadrangular, broadening and converging posteriorly, and traversed by a few coarse striae; opercle with a single strong stria anteriorly and sometimes a few weaker ones along the lower border.

Upper surface blue, the back with one, two, or three more or less distinct golden, dark-edged bands, sides and lower surfaces silvery; cheeks and opercles with a golden tinge: dorsal and caudal fins more or less tinged with yellow and with their extremities black; in the former the outer border is often deeply margined with black, and the short anterior rays are densely dotted with the same colour, while there is an inconspicuous, oblique, dusky band along the middle of the fin: irides golden, clouded above with blue.

Castelnau's Herring, which is the Herring *par excellence* of the Sydney fishermen, has been generally confounded by New South Wales authors with the *hypselosoma* of Dr. Bleeker,* but the differences pointed out below will at once serve to distinguish it from that species, and I am unable to find any other with which it agrees more closely. In order to promote facility of comparison I have placed the differences on which I base my conclusions in parallel columns as below:—

K. hypselosoma.

Base of the anal fin as long as that of the dorsal.

Ventral fins inserted midway between the extremity of the mandible and the base of the caudal.

K. castelnaui.

Base of the anal fin much shorter than that of the dorsal.

Ventral fins inserted much nearer to the base of the caudal than to the extremity of the mandible.

* In my Edible Fishes and Crustaceans of New South Wales, 1893, this fish was inadvertently named *sundaica*, a species from which it is of course entirely distinct.

K. hypselosoma.

Pectoral fin as long as the head, and reaching well beyond the origin of the dorsal.

Caudal fin $3\frac{4}{5}$ to $4\frac{1}{5}$ in the total length

Least depth of the peduncle equal to the free space between the anal and caudal fins.

Dorsal fin unicolorate.

K. castelnaui.

Pectoral fins much shorter than the head, and reaching to or nearly to the origin of the dorsal.

Caudal fin $2\frac{2}{5}$ to $3\frac{1}{5}$ in the total length.

Least depth of the peduncle twice the space between the anal and caudal fins

Dorsal fin tipped with black.

In Dr. Günther's description of *hypselosoma* the following passage occurs:—"Ventral fin inserted below the posterior half of the dorsal fin." This is quite incorrect both as regards the species under consideration and the figure of *hypselosoma* in the Atlas Ichthyologique, in which the ventral fins are directly under the middle of the dorsal, while Bleeker's description of their position is "*media tertia parte ventralibus opposita.*"

The great variation in the depth of the body in specimens taken from the same shoal is liable to make one look with suspicion upon the value of this character, so much insisted on by Dr. Bleeker. One fact is, however, worthy of notice, namely, that no matter what the depth of the body may be the length of the caudal fin is invariably equal to it, so that the more slender the body is the shorter is the caudal fin, and *vice versa*; in all other respects the two forms are absolutely identical.

At the October meeting of this Society I undertook to define at an early date the two recent genera of Rough-backed Herrings, and I embrace this opportunity of redeeming my promise.

HYPERLOPHINÆ.

Anterior dorsal and abdominal profiles more or less compressed and armed with bony serræ; supplemental bone of the maxillary

narrow or wide; dorsal fin inserted above or a little behind the ventrals; anal fin moderate.

Clupeids of small or moderate size, inhabiting the seas and fresh waters of south-eastern Australia and the western shores of South America. Two or three recent genera and four species are now known.

POTAMALOSA.

Potamalosa, Ogilby, Proc. Linn. Soc. N.S. Wales, xxi. 1896, p. 504 (1897).

Body oblong, strongly compressed. Cleft of mouth oblique, the lower jaw projecting; premaxillaries but little emarginate anteriorly; maxillaries narrow. Teeth present in the jaws, on the palatines, and on the tongue; vomer and pterygoids toothless. Eye moderate, with the adipose lid little developed. Lower limb of preopercle short; suborbital bone longer than deep. Eight or nine branchiostegals; pseudobranchiæ rather small; gill-rakers in moderate number, rather short and stout, serrulate. Dorsal fin originating well in advance of the middle of the body; anal fin rather short and deep, composed of eighteen or less rays; ventral fins well developed, with eight rays; inserted below the anterior fourth of the dorsal; pectorals small and pointed, with sixteen or seventeen rays; the upper ones the longest; caudal forked. Scales moderate and adherent, with the free margin rounded and entire; base of the ventral, pectoral, and caudal fins scaly; an elongate scale in the axil of the ventral; dorsal scutes prominent, but not so strong as those of the abdomen, which originate on the front of the throat; muciferous system almost confined to the main arteries. Bones of the head but little striated, the occiput almost, the opercle quite smooth. Vertebrae 46.

Etymology.—*ποταμός*, a river; *Alosa*.

Type.—*Potamalosa antiqua*, Ogilby.

Distribution.—Rivers of the eastern watershed of New South Wales.

HYPERLOPHUS.

Hyperlophus, Ogilby, Rec. Austr. Mus. ii. p. 26, 1892, and Proc. Linn. Soc. N.S. Wales, xxi. 1896, p. 505 (1897).

Body oblong or oblong-elongate, more or less compressed. Cleft of mouth oblique, the lower jaw projecting; premaxillaries moderately emarginate anteriorly; maxillaries broad. A band of small teeth along the middle of the tongue. Eye rather large, with the adipose lid much less developed in front than behind. Lower limb of preopercle short; suborbital bone longer than deep. Four branchiostegals; pseudobranchiæ large; gill-rakers in moderate number, slender, serrulate. Dorsal fin originating on or behind the middle of the body; anal fin moderate and low, composed of nineteen or more rays; ventral fins small, with eight rays, inserted in advance of the dorsal; pectorals small and obtusely pointed, with sixteen rays, the upper ones the longest; caudal forked. Scales moderate and adherent, with the free margin rounded and pectinated; base of the ventral and pectoral fins naked, of the caudal scaly; an elongate scale in the axil of the ventral; dorsal serræ feeble, not nearly so prominent as those of the abdomen, which originate on the front of the throat; muciferous system little developed and almost confined to the main arteries or greatly developed and extending well on the trunk. Bones of the head but little striated. Vertebrae 47.

Etymology.—*ἑπίρ*, above; *λόφος*, a crest; in allusion to the dorsal serrature.

Type.—*Clupea spratellides*, Ogilby.

Distribution.—Coasts of New South Wales and ? Victoria; western shores of South America.

The genus *Hyperlophus* naturally divides itself into two sections or subgenera, which may be characterised as follows:—

- a. Body oblong, strongly compressed, its depth equal to or more than the length of the head; ventral fins inserted well in advance of the middle of the body; muciferous system of the head feebly developed; a silvery lateral band (*Hyperlophus*).

Type.—*H. spratellides*.

- a'*. Body elongate-oblong, slender, moderately compressed, its depth less than the length of the head; ventral fins inserted at or a little behind the middle of the body; muciferous system of the head greatly developed, extending over the shoulders; no silvery lateral band (*Omochetus*).

Type.—*H. copii*.

HYPERLOPIUS COPII, sp.nov.

D. 15-17. A. 19-20. Sc. 48-50/11-12.

Body oblong-elongate, the ventral profile more convex than the dorsal; head moderate, its length $4\frac{1}{5}$ to $4\frac{2}{5}$, the depth of the body $4\frac{3}{4}$ to 5 in the total length; width of the body $1\frac{1}{5}$ to 2 in its depth; depth of the head $1\frac{1}{2}$ to $1\frac{3}{5}$, width of the head $2\frac{1}{3}$ to $2\frac{1}{2}$, of the interorbital region $4\frac{1}{2}$ to 5, diameter of the eye $2\frac{1}{2}$ to $2\frac{2}{3}$ in the length of the head. Orbit circular; interorbital region slightly convex; snout rather short, as long as or a little shorter than the diameter of the eye. Premaxillaries forming together a well marked emargination in front: maxillary subtrulliform, with the lower border finely denticulated, extending to the vertical from the anterior border of the eye; its length is $2\frac{1}{2}$ to $2\frac{3}{5}$ in that of the head and its greatest width $2\frac{1}{3}$ to $2\frac{1}{2}$ in its length. Opercle with its posterior border emarginate, its lower border oblique and gently rounded, and its length $1\frac{2}{3}$ to $1\frac{3}{4}$ in its depth; subopercle moderate and falciform, rounded below, terminating posteriorly in an acute point, its depth $2\frac{3}{5}$ in its length; lower limb of preopercle not extending forwards to below the middle of the eye, the angle rounded, the posterior border slightly convex and subvertical. Twenty-eight to thirty gill-rakers on the lower branch of the anterior arch, the longest 2 to $2\frac{1}{5}$ in the diameter of the eye.

The dorsal fin originates a little nearer to the base of the caudal than to the extremity of the snout; the third and fourth rays are the longest, somewhat longer than the base of the fin, and $1\frac{1}{2}$ to $1\frac{2}{3}$ in the length of the head; the outer border is truncated: anal fin with the outer border truncated, the second or third ray the

longest, but little longer than the diameter of the eye, and $1\frac{4}{5}$ to 2 in the length of the base, which is greater than that of the dorsal fin and much greater than its distance from the caudal; the last ray is thickened and divided to the base and extends when laid back about one-third of the distance to the root of the caudal: ventral fin inserted midway between the extremity of the mandible and the base of the caudal, with convex outer border, the first ray simple and a little longer than the second, $1\frac{4}{5}$ to $2\frac{1}{5}$ in the length of the head: pectoral fin with the outer border rounded, the second ray simple and not so long as the third and fourth, which are the longest, $1\frac{1}{2}$ to $1\frac{3}{5}$ in the length of the head: caudal fin forked, with the lobes equal, its length $1\frac{1}{10}$ to $1\frac{1}{5}$ in that of the head; the least depth of its peduncle is a little more than its distance from the anal.

Scales with inconspicuous carinae radiating from the base; axillary scale of the ventral rather small and lanceolate, its length about two-thirds of the diameter of the eye; dorsal serrature much weaker than the abdominal, originating immediately behind the occiput, and consisting of from twenty-eight to thirty-one keeled scutes; twenty or twenty-one scutes in advance of and fourteen behind the origin of the ventral fin, those immediately in front of the fin the smallest. A single coarse stria descends obliquely downwards and backwards from the origin of the lateral ridge of the occiput across the temporal region, the space intervening between it and the eye smooth; a small triangular area on either side of the occiput smooth or inconspicuously rugose; opercle with a more or less prominent stria parallel to and near its anterior border, its upper third with feeble radiating striae. Surface of the head almost entirely covered by a network of ramifying mucous canals, which extend over the five or six anterior scales of the humeral region in the form of a corselet and are overlaid by a delicate transparent epiderm.

Pale greenish-silvery, with an obscure, dark-edged, silvery lateral band which becomes more prominent upon the tail and bifurcates at the root of the hypural bone; above this band all the scales are provided with a marginal series of blackish dots;

maxillaries and mandible with crowded, snout and interorbital region with more or less scattered similar dots; occiput deep blue; upper half of opercles with a dusky blotch; lower half, sub-, inter-, and preopercles, and the cheeks silvery: dorsal and caudal fins with a series of fine dots along each ray; a single conspicuous dot at the base of each anal ray: irides silvery, clouded above with deep blue.

This beautiful species may now be definitely enrolled as a regular autumn visitor to our coast; the first specimens of which I know were obtained by Mr. Whitelegge on the 31st of March, 1893, and a few specimens were also observed about the same time during the two succeeding years. Last year they appeared in large shoals in the middle of April, and they are again similarly abundant at the present time.

I take the opportunity of dedicating this species to the late Prof. Edward Drinker Cope, who was the first to discover and describe a herring with a dorsal serrature, in recognition of his many and valuable services to science, and as a mark of personal esteem for a valued and much regretted correspondent.*

Length to 100 millimeters.

Type in the Australian Museum, Sydney; register number, I. 3669.

MUGIL HYPSELOSOMA, sp. nov.

D. iv. i 8. A. iii 8. Sc. 40-41/14-15.

Body short and deep, not much compressed, the ventral profile much more convex than the dorsal. Length of the head $3\frac{1}{5}$ to 4, depth of the body $3\frac{1}{10}$ to $3\frac{1}{5}$ in the total length; width of the body below the origin of the first dorsal fin $1\frac{3}{5}$ in its depth;

* In the last letter which the author received from Prof. Cope, he expressed his intention of reviewing the genus *Diplomystus* in connection with the recent discovery of at least four living species. I am unaware whether this intention was carried out, but it appears to me that Cope's genus is clearly divisible into two.

depth of the head $1\frac{2}{3}$, width of the head $1\frac{2}{3}$ to $1\frac{1}{2}$, of the interorbital region $2\frac{1}{9}$ to $2\frac{1}{8}$, diameter of the eye $3\frac{2}{3}$ to 4 in the length of the head; interorbital region very slightly convex; snout very broad and obtuse, a little longer than the diameter of the eye, its upper profile slightly convex. Mouth moderate, with anterior cleft, the lips thin; premaxillaries narrow, meeting below at an obtuse angle; maxillary reaching to the vertical from the anterior border of the eye, and a little longer than its diameter, its distal half only partially concealed beneath the preorbital bone; lower lip included; the dentary bones of the lower jaw forming a very obtusely angular (almost rounded) outline in front, with a very shallow notch intervening. Both jaws with numerous series of short, subclaviform cilia, the anterior row in the lower jaw separated from the others by a smooth interspace; ectopterygoids with a patch of minute teeth; vomer, palatines, and tongue smooth. Adipose eyelid well developed and moderately opaque, reaching anteriorly a little beyond, posteriorly to the edge of the pupil. Preorbital as wide or not so wide posteriorly as the pupil; the hinder half of the lower and the posterior borders finely serrated, the former without notch, the latter rounded. Gill-rakers short and slender, 84 on the lower branch of the anterior arch.

First dorsal fin originating midway between the base of the caudal and the extremity of the snout; the spines are rather weak, the first straight, not much longer than the second, and $1\frac{8}{9}$ in the length of the head; the third spine is considerably shorter than the second, and the bases of these three are in contact; the last spine is inserted far behind the other three and is very feeble, its length being $2\frac{1}{5}$ in that of the first; the space between the origins of the two dorsal fins is as long as or a little longer than the head; the first soft ray of the second dorsal is but feebly branched and not quite so long as the second, which is as high as the first dorsal fin; the last ray is considerably produced, the outer border of the fin being deeply emarginate: the anal fin is inserted below the second dorsal, and the length of its base is $1\frac{2}{5}$ to $1\frac{1}{2}$ in its distance from the caudal; the first soft ray

is the longest and branched, as long as or a little longer than the soft dorsal rays, and when laid back does not extend to the tip of the last ray, which is much produced, the outer border of the fin being moderately emarginate: ventral fin moderate and gently rounded, inserted a little nearer to the origin of the anal than to the extremity of the mandible, with a rather weak spine; the outer ray is as long as or a little longer than the second, $1\frac{7}{10}$ to $1\frac{3}{4}$ in the length of the head, and $2\frac{2}{5}$ to $2\frac{1}{2}$ in the distance between its origin and that of the anal fin: pectoral fin but little pointed, the outer border sinuous, with sixteen or seventeen rays, the two outer ones simple; the second ray is compressed and somewhat broader than the third, which is subequal to the fourth and longest, the distance of its tip from the origin of the first dorsal being two-thirds of the length of the fin, which is two-thirds of that of the head: caudal fin large and deeply emarginate, with the tips of the lobes acute, its length $3\frac{1}{2}$ in the total length; caudal peduncle moderately compressed and strong, its least depth $2\frac{8}{9}$ to $3\frac{1}{5}$ in the depth of the body and $1\frac{1}{2}$ in its length.

Scales cycloid; snout scaly; scales of the preorbital very small; four series of scales below the eye, one of which is on the interopercle, along the upper and lower borders of which are one or two series of small subsidiary scales; axillary scale of the pectoral small; exobasal scale of the ventral as large as or a little larger than that at the base of the spinous dorsal, which extends about half way along the membrane of the last spine; second dorsal and anal fins without scaly basal sheaths, but with a series of small scales extending outwards between the two or three anterior rays.

Dark steel-blue above, silvery below, the sides with indistinct darker stripes along the rows of scales; sides of the head more or less tinged with gold: dorsal and caudal fins dusky, the latter with a tinge of yellow and narrowly bordered with blackish; anal and ventral fins silvery, with the basal third golden; pectoral fins with a narrow black basal bar above, and a brilliant silvery spot covering the rest of the base and extending some distance along the fin; remainder of the fin dusky with a narrow silvery border;

inner surface of the fin dark blue, growing gradually lighter outwards.

During the season of 1896 I procured two specimens of this gray mullet from among the scores of *dobula* exposed in the market, these two having been taken respectively in Port Jackson and Botany Bay; the largest measured 420 millimeters and is in my possession.

The great depth of this fish at once distinguishes it from *dobula*—the only species with which it could be confounded—and is the more remarkable because the examples of that species, in whose company my two specimens were taken, were all distended with more or less fully developed roe, while in these no signs of breeding could be discerned.

MUGIL GEORGII, sp.nov.

D. iv. i 8. A. iii 9. Sc. 32/13.

Body rather short and deep, moderately compressed, the dorsal and ventral profiles about equally convex. Length of head 4, depth of body $3\frac{1}{2}$ in the total length; width of body below the origin of the first dorsal fin $2\frac{1}{2}$ in its depth; depth of head $1\frac{1}{2}$, width of head $1\frac{3}{5}$, of interorbital region $2\frac{2}{5}$, diameter of eye $3\frac{3}{4}$ in the length of the head; interorbital region convex; snout obtuse, a little longer than the diameter of the eye, its upper profile rounded. Mouth small, with anterior cleft, the lips thin; premaxillaries rather broad, meeting below at an obtuse angle; maxillary not reaching as far back as the vertical from the anterior border of the eye, as long as its diameter, concealed except at its extreme tip beneath the preorbital bone; lower lip included; dentary bones of the lower jaw forming an obtuse angle in front, where they are separated by a shallow notch, the articular bones not extending back to below the front margin of the pupil. Upper jaw with a single series of small simple teeth; mandibular cilia moderate and slender, in a single series, united together so as to form a simple flexible flap; vomer, palatines, pterygoids, and tongue smooth. Adipose eyelid present, but delicate and incon-

spicuous, not nearly reaching to the edge of the pupil in front or behind. Preorbital not so broad posteriorly as the pupil, with the hinder half of the lower and the posterior borders serrated; the former with a deep notch, the latter truncated. Gill-rakers rather short and slender, about fifty on the lower branch of the anterior arch.

First dorsal fin inserted a little behind the middle of the body, the distance between its origin and the base of the caudal being eight-ninths of its distance from the extremity of the snout; the spines are rather weak, the first straight, but little longer than the second, and $1\frac{6}{7}$ in the length of the head; the third is not much shorter than the second, and the bases of these three spines are in contact, but not arranged in a straight line; the last spine is inserted at some distance behind the others, is much more feeble, and is but little more than half the length of the first; the space between the origins of the two dorsal fins is equal in length to the head; the first soft ray of the second dorsal is undivided and not quite so long as the second, which is a little lower than the first dorsal fin; the last ray is somewhat produced, and the outer border of the fin is moderately emarginate: the anal fin commences well in advance of and does not extend quite so far back as the second dorsal, the length of its base being a little less than its distance from the caudal; the first ray is the longest and branched, as long as the longest dorsal ray, and when laid back does not extend to the tip of the last ray, which is considerably produced, the outer border of the fin being rather deeply emarginate; ventral fin moderate and slightly rounded, inserted a little nearer to the origin of the anal than to the extremity of the mandible, with a rather weak spine; the outer ray is a little the longest, two-thirds of the length of the head, and half of the distance between its origin and that of the anal fin: pectoral fin pointed, with seventeen rays, the two outer ones simple; the second ray is compressed and broader than the third, which is the longest, the distance of its tip from the origin of the first dorsal being two-fifths of the length of the fin, which is nine-tenths of that of the head: caudal fin but little emarginate, with

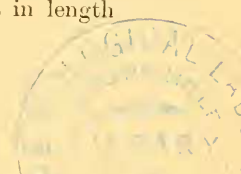
the tips of the lobes acute, its length $3\frac{2}{3}$ in the total length; caudal peduncle deep and strongly compressed, its least depth $2\frac{1}{3}$ in the depth of the body, and $1\frac{1}{3}$ in its length.

Scales mostly cycloid, those on the cheeks, preorbitals, and lower surface feebly ciliated; snout naked; five series of scales below the eye, of which one is on the interopercle; axillary scale of the pectoral small; exobasal scale of the ventral smaller than those at the base of the spinous dorsal, of which there are two on each side, the posterior extending almost as far as the membrane of the last spine; second dorsal with a low, anal with a well developed basal sheath, and with a few small scales between the rays in both.

Back pale olive-brown, the sides silvery, the abdominal region with a golden tinge; preorbital and border of the preopercle golden, the cheeks and rest of the opercles silvery: a deep black spot in the axil of the pectoral, extending downwards along the inner side of the base; anterior ray and extremity of the second dorsal fin dusky; posterior border of the caudal fin blackish; anal, ventral, and pectoral fins yellow: irides golden.

The single specimen from which the description is drawn up was taken by net in the author's presence in the estuary of the George's River during the month of December, 1895, and measures 190 millimeters; it is in my possession. This large-scaled species was known to the fishermen who caught it, but was said to be rare, and as I have paid numerous visits to the same estuary since that date and examined scores of gray mullets from there without meeting with another example I can give that statement at least a provisional corroboration.

Note.—The examination of numerous small mullets while engaged on this quest has, however, been productive of unexpected benefit in another direction, since it enables me to determine that the fish figured by Kner (Voy. Novara, Fisch. pl. ix. f. 6) as *Mugil crenidens* is an immature *Liza peronii*, the tooth figured on the same plate belonging to *Myxus elongatus*. In arriving at this conclusion I have had the privilege of examining in a fresh state a very large series of *L. peronii* from two inches in length



upwards, with the result that I find a single series of slender simple teeth present in all specimens under six inches long.

That the species here described is not a true *Mugil* is evident from the presence of well developed teeth in the upper jaw, but, in view of the discovery above recorded with regard to *Liza peronii*, I prefer to wait until larger examples are procured before removing it from that genus.

CESTRÆUS NORFOLCENSIS, sp. nov.

D. iv. i 8. A. iii 9. Sc. 46-47/12.

Body oblong and moderately compressed, the ventral profile much more convex than that of the dorsal, which is almost linear in advance of the fins. Length of the head $3\frac{8}{9}$ to 4, depth of the body $4\frac{1}{2}$ to $4\frac{1}{4}$ in the total length; width of the body below the origin of the first dorsal fin $2\frac{1}{5}$ to $2\frac{2}{10}$ in its depth; depth of the head $1\frac{2}{3}$ to $1\frac{3}{4}$, width of the head $1\frac{3}{4}$ to 2, of the interorbital region 3 to $3\frac{1}{5}$, diameter of the eye 4 to $4\frac{1}{10}$ in the length of the head; interorbital region slightly convex; snout obtuse, one-fourth of a diameter longer than the eye, its upper profile nearly flat. Mouth moderate, with lateral cleft, the lips thin; premaxillaries narrow, evenly rounded below; maxillary not reaching quite so far as the vertical from the anterior border of the eye and longer than its diameter, its outer margin not concealed by the preorbital; lower lip included; dentary bones of the lower jaw forming a very obtuse (almost rounded) outline in front, without anterior notch; the articular bone extending backwards to beyond the middle of the eye. Upper jaw with a single series of rather strong teeth, which are narrow at the base and much swollen and tricuspid distally, the middle cusp being much the longest and strongly curved inwards; lower jaw with several series of well developed cilia, the outer row being separated from those succeeding it by a naked interspace; vomer, palatines, pterygoids, and tongue smooth. Adipose eyelid rudimentary. Preorbital not so wide posteriorly as the pupil, with the hinder half of the lower and the posterior borders denticulated, the former sinuous, the

latter subtruncate. Gill-rakers long and slender, fifty-seven on the lower branch of the anterior arch.

First dorsal fin inserted a little behind the middle of the body, the distance between its origin and the base of the caudal ninth or more of its distance from the extremity of the snout; the spines are rather weak, the first almost straight, a little longer than the second, and $1\frac{9}{10}$ to 2 in the length of the head; the third is considerably shorter than the second, and the bases of these three spines are contiguous, but not arranged on a straight line; the last is inserted well behind the others and is very feeble, its length being $1\frac{9}{10}$ to $2\frac{3}{10}$ in that of the first spine; the space between the origins of the two dorsal fins is a little shorter than the head: the first soft ray of the second dorsal is branched, as long or not quite so long as the second, which is subequal in height to the first dorsal fin; the last ray is not much produced, and the outer border of the fin is feebly emarginate: the anal fin originates well in advance of and does not extend nearly so far back as the second dorsal, and the length of its base is $1\frac{1}{10}$ to $1\frac{1}{4}$ in its distance from the caudal; the first soft ray is as long as the second and branched, longer than the soft dorsal rays, and when laid back extends to or not quite to the extremity of the last ray, which is not or but little produced, the outer border of the fin being feebly emarginate: ventral fin well developed, with the outer border subtruncate, inserted nearer to the origin of the anal than to the extremity of the mandible, with a rather feeble spine; the outer ray is the longest, $1\frac{2}{3}$ to $1\frac{2}{3}$ in the length of the head and 2 to $2\frac{1}{10}$ in its distance from the origin of the anal fin: pectoral fin pointed, with sixteen rays, the two outer ones simple; the second is but little stronger than the third, which is the longest, the distance between its tip and the origin of the spinous dorsal being a little more than half of the length of the fin, which is $1\frac{2}{3}$ in the length of the head: caudal fin forked, with the tips of the lobes acute, its length $3\frac{3}{4}$ to $3\frac{1}{2}$ in the total length; caudal peduncle moderate and compressed, its least depth $2\frac{1}{3}$ to $2\frac{2}{3}$ in the depth of the body, and $1\frac{2}{3}$ to $1\frac{3}{5}$ in its length.

Scales cycloid, except those of the cheeks, preorbitals, and ventral surface, which are finely ciliated; snout naked; preorbital scales moderate; four series of scales below the eye, one being on the interopercle; axillary scale of the pectoral rudimentary; exobasal scale of the ventral smaller than that of the spinous dorsal, which extends about half-way along the membrane of the last spine; dorsal fin without, anal with a basal scaly sheath; both with a series of small scales between each pair of rays anteriorly.

Blue above, silvery below, the head and sides washed with bronze; some of the scales of the upper surface with a golden spot: a small black spot in the axil of the pectoral; dorsal, pectoral, and caudal fins dusky, the latter tinged with yellow; anal and ventrals yellowish: irides golden.

Two specimens of this very distinct mullet were brought back from Norfolk Island in April, 1896, by the Hon. J. H. Carruthers, on the occasion of his visit to that island for the purpose of proclaiming it a dependency of New South Wales. The largest example measures 255 millimeters, and they are now in my possession.

PSEUDOMUGIL SIGNIFER.

In my paper entitled "A new family of Australian Fishes" (*Proc. Linn. Soc. N.S. Wales, xxi. 1896, pp. 118-135*) the following passage occurs (*p. 123*):—"In the Voyage Novara it is alleged that the fishes, from which Prof. Kner's description was drawn up, were collected at Sydney, but this is manifestly erroneous, &c., &c." For this statement I must apologise to Prof. Kner and at the same time confess that the error was on my part, as I have myself assisted in obtaining several specimens of this beautiful little fish from Cook's River, where it is common, frequenting the dense masses of weed (*Ceratophyllum demersum*, &c.), which fringe the banks, a single sweep of a small hand net sometimes resulting in the capture of these fishes and the fry of our four common Gudgeons, *Carassiops longi*, *Krefftius australis*, *Mulgoa coxii*, and *Ophiorrhinus grandiceps*.

The brilliant orange and black vertical fins of the male fish make it a most conspicuous object, and in this case incidentally led to my paying a visit to its haunts and to the consequent rediscovery of the species, I having been told by Mr. Albert Gale, late Lecturer to the Technical College, of a "golden-finned, blue-eyed fish, rarely more than an inch long," which he sometimes caught when seeking for specimens for his fresh-water aquarium; not being able to place the fish in question, I accompanied Mr. Gale in one of his excursions, with the above pleasing result.

ODAX ATTENUATUS, sp.nov.

D. xx 15. A. i 9. V. i 4. P. 13. Sc. $43\frac{4}{6}$.

Body elongate and slender; upper profile of head convex, its length $4\frac{2}{5}$, the depth of the body $8\frac{4}{5}$ in the total length; depth of head $2\frac{3}{5}$, width of head $2\frac{1}{2}$, of interorbital region $5\frac{3}{4}$, diameter of eye $3\frac{2}{5}$ in the length of the head; snout moderate, rounded in front, one-third of a diameter longer than the eye; interorbital region flat. Jaws equal, the maxillary extending backwards midway to the eye, its length $5\frac{3}{4}$ in that of the head. Preopercle entire.

The dorsal fin commences above the lower angle of the base of the pectoral, the space between its origin and the extremity of the snout being $2\frac{4}{5}$ in its distance from the base of the caudal fin; the rays increase in length to nearly the end of the fin, the longest being $2\frac{1}{4}$ in the length of the head: the anal fin originates below the twenty-first and terminates below the twenty-sixth dorsal ray: ventral fin long and narrow, inserted below the commencement of the middle third of the pectoral, its length $1\frac{7}{10}$ in that of the head, and $2\frac{2}{3}$ in the space between its origin and the vent: pectorals rounded, the upper middle rays the longest, $1\frac{3}{5}$ in the length of the head: caudal peduncle long and slender, its least depth $2\frac{3}{4}$ in the distance between the dorsal and caudal fins.

Upper half of the head and trunk and the tail brown, many of the scales with a darker central spot; lower half of the head and

the abdominal region brownish-yellow : an oblong deep blue spot near the distal extremity of the ventral fin.

Distribution.—Tasmania.

Length (without caudal fin) 95 millimeters.

Type in the Tasmanian Museum, Hobart.

The unique example from which my description is drawn up has been entrusted to me for identification and diagnosis by Mr. Alexander Morton, Curator of the Tasmanian Museum, and is unfortunately in bad condition, several of the rays of the dorsal and anal fins and the entire caudal fin having been broken off; it appears to have been washed ashore and partially sun-dried.

It is easily distinguishable from nearly all the other members of the genus by the great tenuity of the head and body, in which it approaches *Siphonognathus*. Of the species included in Dr. Günther's Catalogue, it approaches most nearly to Quoy and Gaimard's *Malacanthus radiatus*, but it differs from the south-western continental form in the more distinctly attenuated habit, the non-prolongation of the anterior dorsal and the ventral rays, the number of the dorsal and anal rays.

I would have unhesitatingly identified my fish with Mr. Johnston's *Odax beddomei* if it were not that some of the characters relied on by that author, if correct, make such a course impracticable.

As some of my readers may not be able conveniently to refer to Johnston's description and as it will take up but little space, I transcribe it *in extenso* from the Proceedings of the Royal Society of Tasmania, 1884, p. 231, in order to facilitate comparison.

Odax beddomei.

D. 20/12. A. 3/9. P. 12/14. L. l. 40. L. tr. 3/8-9.

Body elongate. Preoperculum entire. Snout much produced and finely pointed. Eye rather large. Height of body one-tenth of the total length and length of head contained in the latter three and one-third times. Upper posterior margin of operculum produced into a flaccid membrane having a rayed appearance. Colour of body and fins reddish, becoming lighter below lateral

line. There is a singular well-marked black elongate streak, margined with a scarcely perceptible yellow border, extending over five of the upper rays of the caudal fin, which latter is somewhat rounded terminally.

Total length $4\frac{3}{4}$, length of body 4, of head $1\frac{1}{3}$, of snout $\frac{8}{12}$, greatest depth of body $\frac{1}{2}$, least depth of body $\frac{1}{4}$ inches, diameter of eye 6 millimeters.

In the above description the number of the fin rays and of the series of scales agrees fairly well, especially as regards the increase (over all the other known species) in the dorsal spines and the decrease in the anal rays.* The discrepancy in the enumeration of the transverse series of scales may be explained away by the fact that my computation was made at the point where the greatest number of scales occurred between the dorsal profile and the lateral line, while Mr. Johnston's was taken at some anterior point, possibly from the origin of the dorsal fin.

The two specimens (Johnston's and Morton's) were almost of the same length—100 mm. and 95 mm. without the caudal fin respectively, and the comparative measurements should therefore have been identical or at least approximate, and such we find to be the case so far as the depth of the body is concerned; but here the similarity ceases, for in Johnston's specimen the head is said to be contained three and one-third times in the total length with the caudal fin and three times without it, while in my specimen the head is four and two-fifths in the total length without the caudal, and even if the cutaneous appendage to the opercle should be included this measurement is only reduced to four and one-fifth. Again Johnston's measurements show the eye—which he describes as "rather large"—to have been contained five and a half times in the length of the head and twice

* Mr. Johnston has recorded three spinous rays as being present in the anal fin of his example, but a most careful investigation under the microscope, both by Mr. Whitelegge and myself, has been unsuccessful in bringing to light more than a single spine in Mr. Morton's fish.

in that of the snout,* while in Morton's example the corresponding figures are only a trifle more than four in the head—dermal flap included—and one and a third in the snout.

If, therefore, Johnston's measurements be correctly given, I am compelled to consider his species as different from mine.

DERMATOPSIS MACRODON.

Since publishing the description of this species (*Proc. Linn. Soc. N.S. Wales. xxi. 1896, p. 140*) a second example, not quite so large as but in much better condition than the type, has been discovered among a number of small, principally immature, fishes collected at various times by Mr. Whitelegge on Maroubra Beach and handed by him to me for identification and, if necessary, description.

An examination of this specimen has enabled me to supplement or correct the original diagnosis in the following particulars:—

The depth of the body is $5\frac{1}{2}$ in the total length, the abdominal region not being shrunk as in the type; the eye is only perceptible as a dull bluish patch, which is scarcely larger than that covering the posterior nostril, to which it has a similar appearance; its diameter is apparently about one-twelfth of the length of the head; the profile of the snout is distinctly rounded; the jaws are of equal length and the lower labial flap is absent; there are two distinct dorsal tubercles, the anterior situated immediately in advance of the vertical from the base of the pectoral; its distance from the posterior is about two-thirds of that between the latter and the origin of the dorsal fin, this distance being as long as the space between the posterior nostril and the extremity of the snout; the dorsal fin originates somewhat further back, its distance from the extremity of the snout being $3\frac{2}{5}$ in the total length, while the origin of the anal is distinctly in advance of the middle third of the dorsal and a little nearer to the base of the caudal than to the extremity of the snout; the length of the

* These measurements agree with those of the small-eyed *richardsonii*.

ventral fin is $1\frac{1}{2}$, of the pectoral $1\frac{2}{3}$ in that of the head, and the caudal fin has fourteen rays. The lower surface of the head, lips, cheeks, and abdomen are white, and the vertical fins are brown with a conspicuous whitish border.

In addition to those mentioned at the end of the generic description (*loc. cit.* p. 139), there is a single large pore above the upper angle of the gill-opening; there is no indication whatever of a lateral line.

The specimen measures 69 millimeters.

Dinematichthys consobrinus, Hutton, from the New Zealand coast, is said by Hector to have two small spines in front of the dorsal fin and may belong to *Dermatopsis* (see Trans. N.Z. Inst. viii. 1876, p. 217, and ix. 1877, p. 466, Pl. ix. f. 77a).

MONOTHRIX, gen.nov.

Body rather elongate and compressed, especially behind; head moderate, the snout short and blunt; mouth anterior and rather wide, with moderate, oblique cleft. Premaxillaries slightly protractile, forming the entire dentigerous portion of the upper jaw; maxillary narrow in front, abruptly expanded behind, extending backwards well beyond the eye; anterior border of the expanded portion bent forwards so as to form a conspicuous odontoid process. Nostrils supero-lateral, of equal size, widely separated, and surrounded by a skinny vesicular lip. Eyes small and supero-lateral, covered by transparent skin. Opercles covered by a continuous skin; opercle with two strong spines, only the upper of which pierces the skin. Gill-openings large, extending forwards beyond the vertical from the distal extremity of the maxillary; isthmus narrow; seven branchiostegals; pseudo-branchiæ present; gill-rakers in very small number, tubercular. Jaws with a narrow band of minute villiform teeth anteriorly, succeeded after a considerable interspace by a series of short, stout, caninoid teeth, which extend backwards along the sides of the rami; a crescentic band of minute teeth on the vomer with a few larger ones interspersed, the outer tooth on each side much enlarged; palatine teeth in a long, narrow band with the outer

series enlarged and conical; pterygoid bones and tongue smooth. No perceptible spinous tubercle in advance of the dorsal fin; dorsal and anal fins low, separated from the caudal by a distinct interspace: ventral fins long, inserted close together and well behind the isthmus, reduced to a slender, simple filament, composed of a single articulated ray: pectorals well developed, pointed, composed of twenty slender, mostly divided rays: tail homocercal, the caudal fin narrow. Genital papilla present. Scales small, cycloid, and imbricate; head naked; only the basal portion of the vertical fins enveloped in loose, naked skin. No conspicuous open pores on the head; bones of the snout and interorbital region cavernous. No apparent lateral line.

E t y m o l o g y.—*μόνος*, single; *θήξ*, a hair; in allusion to the single, filiform, ventral ray.

D i s t r i b u t i o n.—Coast of New South Wales; ? Andaman Archipelago.

MONGTHRIX POLYLEPIS, sp. nov.

D. 95. A. 53 + *x*. Sc. 135.

Body moderately elongate, strongly compressed posteriorly. Head moderate, its length $4\frac{1}{2}$, the depth of the body 6 in the total length; depth of the head $1\frac{6}{7}$, width of the head $1\frac{3}{4}$, of the interorbital region $5\frac{1}{3}$, diameter of the eye $7\frac{2}{3}$ in the length of the head; snout blunt, with rounded profile, covered with thick loose skin, two-thirds of a diameter longer than the eye; interorbital region slightly convex and rugose. Mouth rather large, its cleft oblique, extending nearly to the vertical from the middle of the eye; the premaxillaries are but little protractile; they form the entire dentigerous portion of the upper jaw, have the lateral portion well developed and of about equal width throughout, and do not extend backwards as far as the anterior border of the maxillary, which is narrow in front, the posterior third being abruptly expanded; the front margin of the expanded portion is curved downwards and forwards so as to form a strong odontoid process; behind this process the lower half of the hinder margin is scalloped, the upper half subtruncate with the angle rounded;

the maxillary extends to about one diameter behind the eye, its length being $1\frac{9}{10}$ in the head, and its greatest width, including the process, half of a diameter more than the eye; the jaws are of equal length, and the lower is provided with a free lip, which is shallow in front and forms a deep flap on the sides; the dentary bone reaches backwards almost as far as and along the inner side of the expanded maxillary. Both jaws are armed with a narrow band of small acute teeth anteriorly, behind which and separated by a considerable interspace is a single series of short stout teeth, which extend backwards along the sides almost to the angle of the mouth, and some of which, especially on the sides of the lower jaw, are provided with a broad base and strongly hooked backwards and inwards; a crescentic band of minute teeth on the head of the vomer, among which are placed at regular intervals a few long, slender, detached teeth, those at the outer ends being the largest; palatine teeth in a narrow band, which extends as far back as those of the premaxillaries; the outer series is enlarged and conical, the rest minute and sharp pointed; pterygoid bones and tongue edentulous. Both nostrils are of moderate size, circular, and surrounded by a low skinny rim; the anterior pair are situated on the front edge of the nasal bone and are as large as and somewhat more approximate than the posterior, which open immediately in front of the middle of the eye. Eye small, entirely covered by a delicate membrane. Opercle with two strong spines, the upper one horizontal and approximating to the upper border, with acutely pointed free tip; the lower directed obliquely downwards and backwards and entirely concealed beneath the loose skin, which is continuous across the gill-covers. Gill-rakers reduced to two or three smooth knobs near the joint of the anterior arch.*

No perceptible dorsal tubercle; the dorsal fin originates a little in advance of the middle of the pectoral, and its distance from the extremity of the snout is $3\frac{2}{5}$ in the total length; the rays are slender and deeply branched, those of the third quarter a little

* As well as can be seen from an outward view



the longest, $2\frac{3}{5}$ in the length of the head: the anal fin commences beneath the origin of the second quarter of the dorsal and is in all respects similar to that fin; the space between its origin and the extremity of the mandible is $1\frac{1}{5}$ in its distance from the base of the caudal fin: ventral inserted but little in advance of the free margin of the opercle, as long as, the pectoral two-thirds of the length of the head: caudal fin with rounded base and fourteen rays.

Pale yellowish-brown, with the fins lighter.

The unique specimen was picked up on the beach at Maroubra by Mr. Whitelegge; it was dead, but quite fresh, and in a perfect condition, but for the loss of about half of the caudal fin; a portion of the anal, consisting of from fifteen to eighteen rays, and commencing at the tenth ray, is also missing.

Length 55 millimeters.

Type in the Australian Museum, Sydney; register number I. 3654.

Monothrix polylepis agrees fairly well with Mr. Alcock's *Dinematichthys piger* (*Ann. & Mag. Nat. Hist.* (6) vi. 1890, p. 432), from which, however, it may at once be distinguished by its much smaller scales and more numerous dorsal and anal rays; possibly also by the shape of the maxillary.

The character of the dentition and the uniradial ventrals separate these two species from *Dinematichthys* and its allies.

AUSTROPHYCIS, gen.nov.

Body moderately elongate and strongly compressed throughout. Head rather large and tumid, with short rounded snout; mouth anterior, with wide oblique cleft; lower jaw included; chin with a barbel. Premaxillaries slightly protractile, forming the entire dentigerous portion of the upper jaw; maxillary narrow, its distal extremity exposed and but little expanded. Upper jaw with a narrow band of small cardiform teeth, the two outer series enlarged and separated from the inner portion, which is triserial, by a distinct interspace; lower jaw with three series of teeth similar to the outer premaxillary ones; vomer, palatines, pterygoids, and

tongue edentulous. Nostrils approximate, pierced in a deep depression in front of the eye. Eyes very large, supero-lateral. Opercle with a feeble spine, which does not pierce the skin and with the border serrated. Gill-openings wide, extending forwards to below the angle of the mouth; isthmus wide; six branchiostegals; gill-rakers in small numbers, distant, serrulate. Dorsal fins two, the first well developed, with ten rays; second dorsal and anal fins long and low, the latter the longer and originating below the middle of the dorsal interspace, separated from the caudal by a short interspace: ventral fins widely separated, inserted but a short distance behind the isthmus, and consisting of five slender rays standing upon a narrow base: pectorals well developed, pointed, composed of twenty-five slender, simple rays: tail homocercal, the caudal fin narrow. Scales of moderate size, cycloid, and imbricate;* vertical fins apparently enveloped in great part in thick skin.

Etymology.—*Auster*, south; *Phycis*.

Distribution.—Coast of New South Wales; Maroubra Bay.

This genus is allied to *Physiculus*, but the character of the dentition, the armature of the opercle, and the anterior origin of the anal fin afford valid grounds for the formation of a new genus as here proposed.

AUSTROPHYCIS MEGALOPS, sp.nov.

D. 10, 45. A. 49.

Body moderately elongate and strongly compressed, not attenuated posteriorly. Head large and tetrahedral, its length $4\frac{1}{5}$, the depth of the body 6 in the total length; depth of the head $1\frac{1}{5}$, width of the head $1\frac{7}{10}$, of the interorbital region $4\frac{6}{7}$, diameter of the eye $2\frac{5}{6}$ in the length of the head; snout short and blunt, with the upper profile concave owing to the prominence of the supra-orbital region, its length about two-thirds of the diameter of the

* Owing to the bad state of the specimen, only a few scattered scales remain *in situ*.

eye* ; interorbital region slightly concave. Mouth large, with oblique cleft, which extends to the vertical from the anterior margin of the pupil; the premaxillaries are but little protractile; they form the entire dentigerous portion of the upper jaw; the lateral portion is equally slender throughout and does not extend backwards so far as the maxillary, which is narrow and feeble, only the extreme distal portion being slightly expanded and spatuliform and reaching to the vertical from the posterior margin of the pupil; its length being a half of that of the head; lower jaw included; the chin with a median barbel, which extends when laid back to the isthmus.

In front of the eye there is a deep pyriform depression which is narrowest forwards, along the inner side of which the anterior and larger nostril opens, while the posterior is pierced along its orbital face and further out than the other. Eye very large and prominent, encroaching upon the upper surface of the head and extending downwards over three-fifths of its side; all the bones of the orbital ring more or less prominent, but especially in front and behind the eye. The upper border of the opercle bears a conspicuous ridge which terminates in a feeble spine which is concealed beneath the skin and is scarcely perceptible; the entire surface of the bone is ornamented with radiating striae, the extremities of which form a distinct though weak marginal serrature. Eight gill-rakers on the lower branch of the anterior arch, the longest at the angle and one-fourth of a diameter of the eye in length; the last two are very small and the front half of the arch is quite smooth.

The first dorsal fin originates well behind the base of the pectorals, its distance from the extremity of the snout being $3\frac{1}{2}$ in the total length; the first ray is rather short, the others slender and more or less elongated, the fifth the longest, half the length of the head; there is a moderate interspace between the dorsal fins, which does not appear to have been occupied by membrane; the second dorsal commences a little behind the vertical from the

* In its contour it has a perceptible resemblance to some of the Muraenids.

origin of the anal, the distance between which and the extremity of the mandible is $1\frac{1}{5}$ in its distance from the base of the caudal:* ventral inserted below the posterior border of the eye, composed of five rays, standing on a narrow base, the two outer ones being elongate, the others short, slender, and filiform; the second ray is the longest, not quite reaching to the origin of the anal, its length $1\frac{1}{5}$ in that of the head: pectoral fin pointed reaching well beyond the origin of the anal, and $1\frac{2}{3}$ in the length of the head: caudal fin rounded, with twenty slender, mostly branched rays, and numerous short unarticulated ones, extending forwards nearly as far as the dorsal and anal fins, above and below, its length $8\frac{2}{3}$ in the total length.

Pale brownish-yellow, the snout, orbital ring, dorsal and caudal fins, and the outer border of the anal, especially near its termination, much darker; throat and abdomen silvery.

This is yet another of my friend Mr. Whitelegge's Maroubra Bay discoveries, the single specimen as yet known having been picked up by him on the beach in a somewhat shrivelled and sun-dried condition.

Length 73 millimeters.

Type in the Australian Museum, Sydney; register number I. 3655.

OTOPHIDIUM GENYOPUS, sp.nov.

Body moderately elongate, strongly compressed, tapering very gradually to the base of the caudal fin; its depth at the shoulder one-seventh of its length; head of moderate size, with the upper profile very convex; its length one-fifth of the total length; its depth two-thirds, its width four-ninths of its length; snout short and rounded in front, projecting beyond the lower jaw, which is

* Owing to the state of the specimen I am unable to determine with accuracy the position and length of the longest dorsal and anal rays, but some of those in the posterior third of the latter fin are about half the length of the head.

included; mouth with moderate, nearly horizontal cleft, the premaxillaries extending backwards almost as far as the maxillaries; maxillary reaching to the vertical from the posterior margin of the eye, expanded and truncated behind, its length four-ninths of that of that of the head, its width three-tenths of its length. Jaws with a band of small conical teeth, which are divided into two series by a median longitudinal groove, each series consisting of two or more rows; vomer and palatines toothed. Nostrils widely separated, the anterior situated near the tip of the rounded snout, the posterior in front of the middle of the eye; an open pore, similar in appearance to the posterior nostril, above and a little behind the front margin of the eye. Eye large, its diameter one-third of the length of the head; interorbital region convex, its width equal to the length of the snout and two-ninths of the length of the head. Opercular spine strong and acute, its exposed portion two-fifths of the diameter of the eye.

The dorsal fin commences above the middle of the pectoral, the distance between its origin and the extremity of the snout being $3\frac{2}{3}$, that between the origin of the anal and the snout $2\frac{2}{3}$ in the total length; the rays of both fins increase in length posteriorly, the longest being on either side of the caudal fin, and as long as it: ventral inserted below the anterior third of the orbit, and extending when laid back beyond the base of the pectoral, the length of the longer filament four-fifths of that of the head: pectoral pointed, four-sevenths of the head, and extending about two-thirds of the distance between its base and the vent: caudal very small, rounded, about half the diameter of the eye in length. Scales very small, deeply imbedded.

Pale gray-green, everywhere powdered with microscopic darker dots, except along a broad lateral band, the cheeks, preopercles, undersurface of head, and abdominal region, the latter being silvery; occiput with a reddish-brown tinge and the dots coalescent into small round spots; the dots along the base of the dorsal and anal fins similarly coalescent into a narrow dark streak: irides pale blue.

The species differs from *Otophidium tigrinus* in its shorter and deeper body, longer head, much larger eye, anterior insertion and much greater length of the ventral filaments, absence of an enlarged outer row of teeth, &c., and should not perhaps be included in the same genus.

The only specimen as yet seen was collected by Mr. Whitelegge on Maroubra Beach during the current month and measures 42 millimeters.

Its register number in the Australian Museum is I. 3660.